GEOG 105E - Introduction to Mapping, GPS, Remote Sensing and GIS

3 credits, 3 hours lecture, 3 hours lab
The course will train students in the use and application of paper, digital, and computer methods for acquisition, presentation and interpretation of geospatial data. Topics will include topographic and reference maps, scales and coordinate systems, land survey systems, global positioning systems (GPS), thematic maps, remote sensing air photo interpretation, and the utilization of geographical information systems (GIS) with ArcView. Emphasis will be placed on practical applications, but some understanding of basic principles is also essential. Lab work will cover a broad spectrum of interest areas, but also linked where possible to environmental applications.

Instructor

Paul Knaga
Office location: Room S211F
Phone number: 780-791-4813

Office Hours

Monday -   06:00 - 06:30 p.m. and by appointment
Tuesday -   06:00 - 06:30 p.m. and by appointment

Hours of Instruction

Monday -   06:30 - 09:30 p.m., Room S105
Tuesday -   06:30 - 09:30 p.m., Room S105

Required Resources

<u>Geographic Information Science and Systems</u>
P. Longley, M. Goodchild, D. Maguire and D. Rhind; 5th Edition

Course Outcomes

The student will be able to:

- Identify and effectively use GIS technologies with emphasis on ESRI's ArcGIS Desktop.

- Explain topographic maps, map scales, symbols, and projection systems.

- Explain GPS and GIS data, and demonstrate this understanding in data analyses and in mapping.

- Describe and work with thematic maps and cartographic principles.

- Work directly with remotely sensed images, and create useable data.

- Discuss the basic principles of remote sensing.

- Explain GIS components and their functionality,

- Describe GIS and illustrate applications at work, as well as in everyday life.

Evaluation

Please note: It is a requirement that all assignments and tests must be submitted as a condition to passing this course.

Evaluation Method	Percentage	Due Date
Lab Assignments	50% (10% each)	End of weeks 2, 5, 9, 11, 14
Midterm Exam	20%	End of week 7
Final Exam	30%	Monday, April 18
Total	100%	

A grade of C- is required for progression or transfer.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory **Progression**	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor **Minimum Pass**	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

Week	Main Topic	Subtopics	References
1	Introduction to GIS and Geomatics	GI Systems, Science and Technologies. What is GIS? Nature of Information. History of GIS. Applications.	Longley et al. (2005). Chapter 1 and 2. Jian Guo Liu et al. (2009). Chapter 11.
2		Introduction to ESRI ArcGIS and GIS Data Management	What is ArcGIS? ESRI 2001-2008 publications. Getting to Know ArcGIS Desktop by Tim Ormsby et al.2001
3		Representing Geography and Nature of Geographic Data,	Longley et al. (2005). Chapter 3, 4, 12
4	Geographic Concepts for GIS	Cartography as Related to GIS / Global Positioning and Systems and Data	TBD
5		Georeferencing, Ellipsoids and Reference Systems	Longley et al. (2005). Chapter 5
6		GIS Data Collection and Capture	Longley et al. (2005). Chapter 9
7		Mid-Term Exam	
8		Reading Week	
9	GIS Database and SQL	Creating and Maintaining Geographic Database, Query, Data Analysis, Data Display	Longley et al. (2005). Chapter 10
10	GIS Software and Data Mining	GIS software, Spatial Data Mining, Web based resources, and data online	Longley et al. (2005). Chapter 7
11	GIS Data Models	Vector GIS and Capabilities	Longley et al. (2005). Chapter 8
12		Raster GIS and Capabilities	Longley et al. (2005). Chapter 8
13	Remote Sensing and Image Processing	Introduction to Remote Sensing and remotely sensed data Image processing and Operations	NRCAN Tutorial -Fundamentals of Remote Sensing. Jian Guo Liu et al. (2009). Chapter 19
14	Application of Geomatics	Case studies, applications and relevance to natural resources management. Future of GIS	TBD
15	Review	Overall review of lectures, labs and concepts.	

Please Note:
Date and time allotted to each topic is subject to change. It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

Performance Requirements

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College 2015-2016 credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports

Counselling and Disability Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

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Paul Knaga, Instructor

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Louis Dingley, Chair   Date Authorized

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Guy Harmer, Dean   Date Authorized

Signed copies to be delivered to:
Instructor
Registrar's Office